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Food habits of Louisiana boys and girls: how good are they?

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Food Habits of Louisiana Boys and Girls

how good are they?

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Food Habits of Louisiana Boys and Girls How Good Are They?

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What do the children of Louisiana eat? Is it a satisfactory diet? Will it give them the essential food they need for body building? Does it lack any food element? Does the diet of our children contain enough of the protective foods?

These are a few of the questions asked by nutritionists at Louisiana State University a few years ago. They decided to find out just how well the children of Louisiana were fed. The only way to learn the answers to the questions above was to ask the children or their parents what they were eating. Therefore, a survey of the eating habits of elementary school children was made by some of the Nutrition Staff (1)[1] of the Agricultural Experiment Station at Louisiana State University. This report is a condensation of some of the results of that study.

AREAS OF THE STUDY

Louisiana is easily divided into areas depending on the type of land and crops grown. As a first step in the survey four agricultural areas of the state were drawn on a map of Louisiana (Figure 1). These areas were called Area A, Area B, Area C, and Area D. Area A was the southeastern section of Louisiana known for its sugar plantations and truck farming and included both Baton Rouge and New Orleans. Area B was the southwestern, rice growing part of Louisiana. The northern part of the state was divided into two areas. Area C was the Red River and Mississippi River Delta areas. Area D was the upland piney wood area. Upland cotton farms are found here also.

With these four areas in mind, the next step was to select the schools and the children so that a portion of each area would be represented.

SELECTION OF THE CHILDREN

The number of children selected from each agricultural area was in proportion to the elementary school population of that area

*The pictures in this publication were furnished by Louisiana State Department of Education, School Lunch Section, Gladys McCartney, photographer.

[1]Numbers in parentheses refer to the list of references, page 28.

as compared to that of the entire state. Seven hundred and fifty-two children from Area A, 127 from Area B, 231 from Area C, and 112 from Area D were selected. Boys and girls, ages 8 through 12 years, were used. All of the children from each school grade selected were subjects. Since many children live in orphanages, the children who were 8 to 12 years of age in four orphanages of the state were asked to keep a record of their diets also. The selection of schools was determined by accessibility of the schools to the University, and the willingness of the parents, school and health officials to cooperate. No child was asked to help until the parent's consent was obtained. The total number of white children in the study was 1,222. There were 623 boys and 599 girls from 19 schools in 12 parishes of the four agricultural areas who participated in the study. Table 1 shows the number of children from each school and parish.

THE RECORDS

The simplest way to know what a group of children (or adults for that matter) are eating every day is to ask them to write down

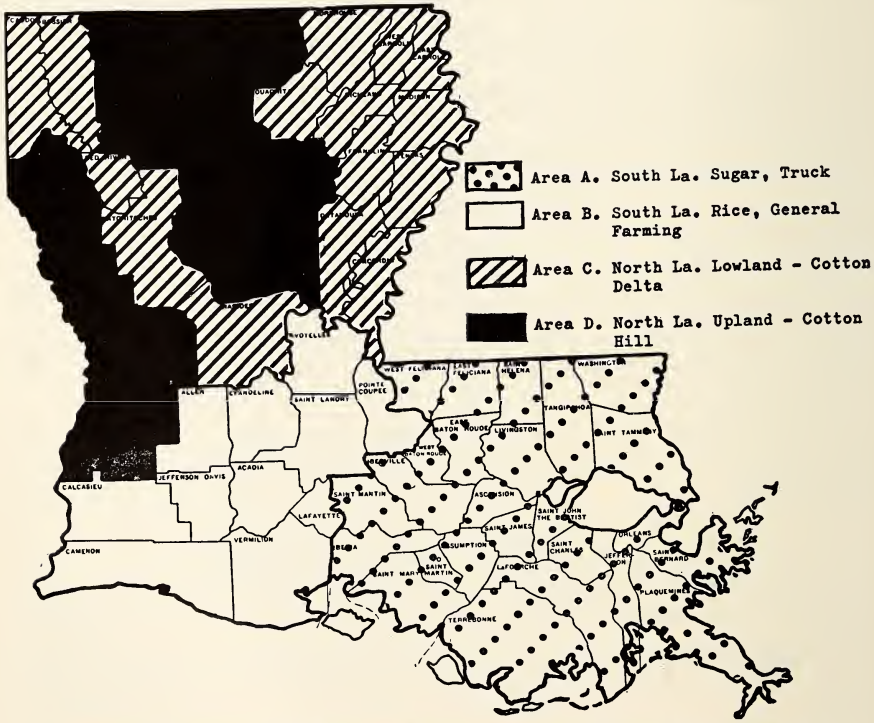


Figure 1. Division of Louisiana According to Types of Farming.

TABLE 1. Distribution of 1,222 Subjects According to Agricultural Area, Parish, and School

Agricultural Area	Parish	School	Number of Subjects
Area A	East Baton Rouge	Dufrocq	56
		Highland	66
		Protestant Orph.	6
		University High	105
		Woodlawn	51
	Orleans	Gentilly Terrace	115
		Gumbel	12
	Iberville	Plaquemine Elem.	81
		Crescent	77
	St. Martin	Breaux Bridge	80
	St. Tammany	Covington	103
	Total Area A		752
Area B	Avoyelles	Bunkie	71
		Marksville	56
	Total Area B		127
Area C	Bossier	Bossier Elem.	99
	Franklin	Winnsboro	74
		Wisner	25
	Ouachita	Baptist Orphange	17
	Rapides	Masonic Home	16
	Total Area C		231
Area D	Lincoln	Eastland	19
		Junior High	32
	Winn	Winnfield	61
	Total Area D		112

what they eat. That is what the children on this study were asked to do. They kept a record of everything they ate or drank, whether it was part of a meal or a snack, for seven days. The nutritionists taught the older children how to use the record sheets and the parents helped the younger children. At the end of the week the records were collected. The foods eaten were classed by food groups and a count was made from the records.

MEASUREMENT OF THE DIET

How Are the Needs of Children Measured?

There are several ways to find out whether a person eats the food that will make him a healthy, well-nourished individual or whether he has a diet that is deficient in some essential nutrient. Nutritionists have found that a person must eat certain amounts of a variety of food or he will lack some vitamin or mineral important to good health.

One way of measuring the amount of a vitamin or a mineral or the number of calories contained in a food is to take the food into a chemical laboratory and analyze it. Or, the figures for the nutrient value of each food eaten can be found in books containing tables of food values and the actual amounts of each nutrient can be calculated.

An easier and quicker way to measure the adequacy of a diet is to divide the meals for a day (or a week) into food groups according to a pattern given by the Food and Nutrition Board of the National Research Council. This board was organized in 1940 to advise on problems of nutrition in connection with National Defense. In addition to this service the Board has published recommended allowances (3) for ten nutrients (calories, protein, calcium, iron, vitamins A, C and D, riboflavin, thiamine, niacin). These "allowances" were based on the findings of research workers in nutrition all over the country and were the amounts of each nutrient recommended (or needed) for the best nutritional health.

In addition to these "Recommended Allowances" a pattern (4) for an adequate diet was made. The foods important for good nutrition were classified into seven groups based on nutritional content and use in meals. This was known as the "Basic Seven" and first was used in nutrition classes during World War II. This same pattern was used to divide into groups the foods found in the diets of the Louisiana children. Some of the food groups were sub-divided so that 10 food groups were formed. Table 2 shows these food groups and the number of servings needed each week for a good, nutritious diet. A serving was the amount of each food ordinarily eaten at one time, such as one-half cup of a fruit or a vegetable, three ounces of meat, one egg and one glass of milk.

KINDS OF FOOD EATEN

What Do the Children of Louisiana Eat?

This question was answered by the records the children kept of what they ate each day for a week. The number of servings of

TABLE 2. Ten Food Groups and Recommended Number of Servings

No. of Servings		Food Groups
Daily	Weekly	
1	7	Leafy, green and yellow vegetables
1	7	Citrus fruit and tomatoes
2	14	Potatoes, other vegetables and fruits
2	14	Milk, ice cream
1	7	Meat, poultry, fish
*	*	Legumes, nuts, cheese
	5	Eggs
2	14	Bread, flour, cereals, whole-grain or enriched
2	14	Butter and margarine

*Used as meat substitutes.

each food was counted for each child separately. Then the average number of servings of each type of food for all the children in one school were figured. In the same way the average number of servings of foods in each food group was made for each area. These averages were compared to the recommended number of servings for that food group given by the National Research Council.

What does an average mean? It doesn't mean much when individual children are to be considered. For example, the average number of eggs consumed in Area A was four per week. The average number of eggs eaten by the children in one school was two, in another it was six eggs, in another five, and in another school three eggs. The average number for the whole area, then, was four. Seventy-five children had no eggs and 196 children had less than three eggs a week in this area. An average is a general figure and should be used with care. If only 60 or 70 per cent of the children are well-fed, the other 30 or 40 per cent of the children should not be forgotten even though the "average" amount eaten appears to be adequate.

A combination of foods from all the 10 food groups is necessary so that all of the essential nutrients are included in the diet. Each group of foods contributes several of the nutrients but no one food contains everything required for a health-giving diet. The kinds and the amounts of food eaten by the children in Louisiana, as it was divided into the 10 groups, follow.

Leafy, Green and Yellow Vegetables

One or more servings of leafy, green or yellow vegetable should be eaten each day. This adds up to seven or more servings a week. In Louisiana the children ate green vegetables such as mustard, turnip tops, cabbage, collards, spinach, broccoli, lettuce (and other salad greens), green peppers, peas, and green string beans. Yellow vegetables eaten by the children were carrots, sweet potatoes, yellow squash, corn, and pumpkin. These vegetables are the main source of vitamin A. Also, some vitamin C is found in these vegetables, if the vegetables are eaten raw. Cooking of the vegetables destroys the vitamin C but not the vitamin A. Vegetables also supply some minerals to the diet.

Citrus Fruit and Tomatoes

It is essential to eat one serving or more of citrus fruit or tomatoes daily to insure an adequate amount of vitamin C (ascorbic acid) in the diet. The children ate oranges, grapefruit, and tomatoes raw most of the time. Cooked tomatoes, lemonade, strawberries, and some melons were eaten, also, and are very good sources of vitamin C. Tomatoes also supply vitamin A.

Other Fruits and Vegetables

In addition to the leafy, green and yellow vegetables the children ate many other kinds of vegetables. Also, fruit other than citrus fruit was eaten. The "other fruits and vegetables" reported included beets, lima beans, turnips, cucumbers, celery, onions, apples, bananas, grapes, pears, fruit mixtures, prunes, and other dried fruits. These foods contribute some vitamins and minerals and are necessary supplements to the diet. Variety in food selection is essential for pleasure in eating as well as to aid in preventing deficiencies.

Potatoes

White or Irish potatoes furnish energy and, if they are eaten daily, an appreciable amount of vitamin C is added to the diet. Louisiana children do not eat them daily. However, the other vegetables which were eaten, plus the large quantity of cereals consumed, added needed calories and minerals to the diet.

Milk

All children need milk. It is impossible for growing children to get sufficient calcium for building bones and teeth without milk. Milk is a good source of riboflavin, one of the B vitamins. Al-

though the green vegetables, eggs, and enriched cereals contain this vitamin, milk is the richest food source. Cheddar cheese and ice cream, which contain milk, also are rich sources of calcium and riboflavin. Milk contains nearly all the other food nutrients so is called "the most perfect food." In Louisiana most of the children drank plenty of milk.

Meat, Fish, and Poultry

At least seven servings a week of some kind of meat is essential to furnish the protein needed by growing children. Meats also contribute the B vitamins to the diet. The children of Louisiana are fortunate to be in a state where a very wide variety of meats is available. The children ate the usual meats—beef, veal, lamb, fresh pork, and ham—prepared in a variety of ways. Fish is plentiful in Louisiana, and oysters, crab, shrimp, crayfish, and many other kinds of fresh and canned fish were eaten. Chicken and some turkey were included in the diets as well as wild birds (duck, quail) and game (squirrel and rabbit). The abundance of meat, fish, and poultry in Louisiana was reflected in the large amount of this type of food eaten.

Eggs

Eggs are an important source of protein, iron, riboflavin, vitamin A, and some of the other vitamins. They are a necessary supplement to meat since eggs contain some nutrients lacking in meat. Louisiana children ate fewer than the five eggs a week recommended by the National Research Council.

Cereals

In Louisiana the law requires the enrichment of all wheat flour and breads with certain nutrients (some of the B vitamins, calcium, and iron). The total requirement for these nutrients cannot be obtained by eating bread, but enriched bread contributes much to make diets adequate in these nutrients. Cereals of all kinds are energy giving foods, so essential to the active child. Louisiana children eat large amounts of enriched white bread. In addition the consumption of rice, macaroni, spaghetti, hominy grits, breakfast cereals, and some corn meal was reported. Not much whole grain bread or cereals were eaten.

Dry Legumes, Nuts, and Cheese

Dry legumes, nuts, and cheese are rich sources of protein. The quality of protein in dried peas and beans is not as good as the

quality of meat, egg, and milk proteins, but legumes are a cheaper source of protein and of some of the B vitamins. Generally, these foods are classed as "meat substitutes" and can be used to add variety to the diet. They should replace only part of the meat.

Butter and Margarine

All fats add calories to the diet. Butter and margarine contribute vitamin A to the diet in addition to calories. Other fats do not contain this vitamin. In Louisiana, margarine was reported more often than butter, except that butter was served for the school lunch. Butter contains some vitamin A, and this vitamin is added to margarine, making both important sources of the vitamin.

AMOUNTS OF FOOD EATEN

How Well Do the Children of Louisiana Meet Requirements?

Now let's turn back to the children in each of the four areas of the state. As was shown in the previous section, the children are eating some food from each group. Are the white children of Louisiana eating enough of these foods? One can see from Table 3 that the children of the state eat plenty of some foods but not enough of the others. As the following graphs (Figures 2-9) show, the type of foods eaten differs from one area to another.

The children in southern Louisiana and in the delta areas do not eat enough green and yellow vegetables or citrus fruit. Children

TABLE 3. Average Number of Servings Eaten by Children in Four Areas of Louisiana

Food Groups	Amounts Needed*	Area A	Area B	Area C	Area D
Leafy, green, yellow vegetables	7	6	6	6	10
Citrus fruits and tomatoes	7	6	6	5	7
Potatoes	7	4	5	4	5
Other fruits and vegetables	7	10	8	11	11
Milk	14	19	16	15	14
Eggs	5	4	4	4	4
Meat, poultry, fish	7	11	8	10	7
Meat substitutes	**	5	3	4	3
Cereals, enriched or whole grain	10	20	17	19	16
Butter or margarine	14	8	4	7	6
Sugars and sweets	Calories only	17	11	19	8

*National Research Council Recommendation.
**Meat substitutes include dry legumes, nuts, and cheese and may replace 2 to 3 servings of meat.

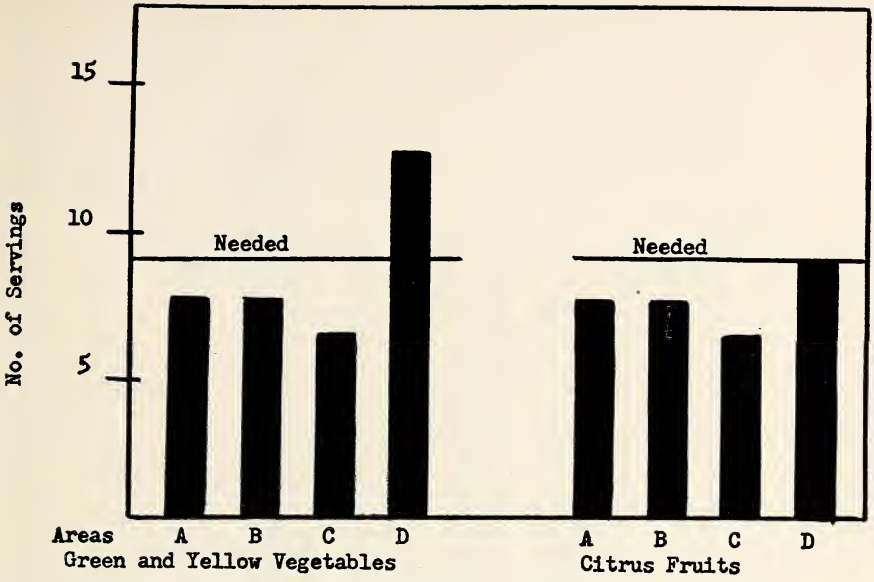


Figure 2. The Children in Southern and Eastern Louisiana Need More of These.

need at least seven servings a week from each of these two food groups. The average number of servings of each of these food groups in Areas A and B was six, but in Area C only five servings a week were eaten by the average child. Since this is an average, it means that some children ate less. In Area D the children ate plenty of green and yellow vegetables and the required amount of citrus fruit. Since all the children reported that they ate small quantities of margarine and butter, the amount of vitamin A in many diets is probably low. The amount of vitamin C is undoubtedly low in many children's diets also (Figure 2).

Figure 3 shows the number of servings of potatoes and of fruits and vegetables other than the green or yellow vegetables and citrus fruits. Louisiana's children eat a variety of these fruits and vegetables but not many potatoes. In Area B the children need more vegetables of all kinds.

The children in all areas had plenty of milk especially when ice cream was included in the count of the number of servings (Figure 4). Too, all children had enough meat. When all protein foods were averaged together, Areas A, B, and C exceeded the required number of servings (two servings a day, or 14 servings a week) and Area D met this requirement (Figures 5, 6). However, for the best diet, a child should have five eggs a week. Only an

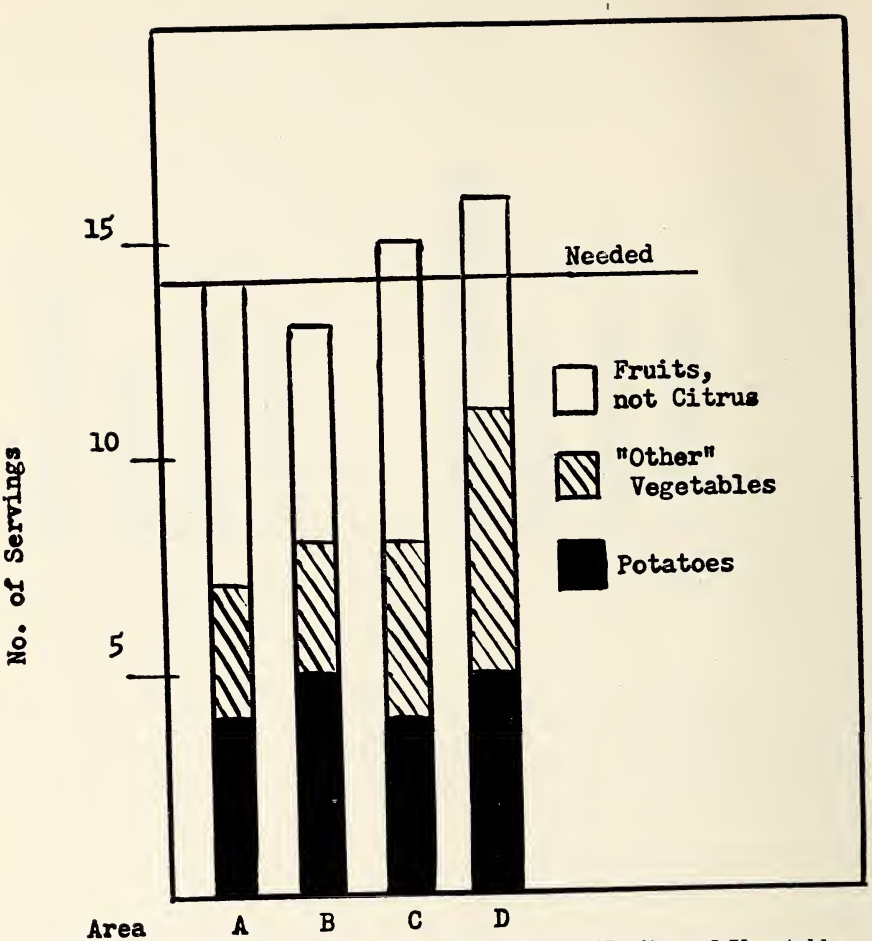


Figure 3. Louisiana's Children Eat a Variety of Fruits and Vegetables but Not Many Potatoes.

average of four eggs a week were eaten by the children in all the areas of the state.

Cereal foods are well liked in Louisiana. All children ate an abundance of enriched bread, which was usually white bread. Rice was eaten frequently. In fact, this cereal is more common in all areas of Louisiana than white potatoes and possibly replaces the potatoes to some extent. More rice was eaten in the upland area and in the rice growing area but the children in other areas also enjoy rice. Grits and spaghetti were more commonly eaten in Area A, and corn meal was popular in Area D (Figure 7).

The minimum of 14 servings of butter or margarine a week was not met (Figure 8). Whether this is the actual fact or whether

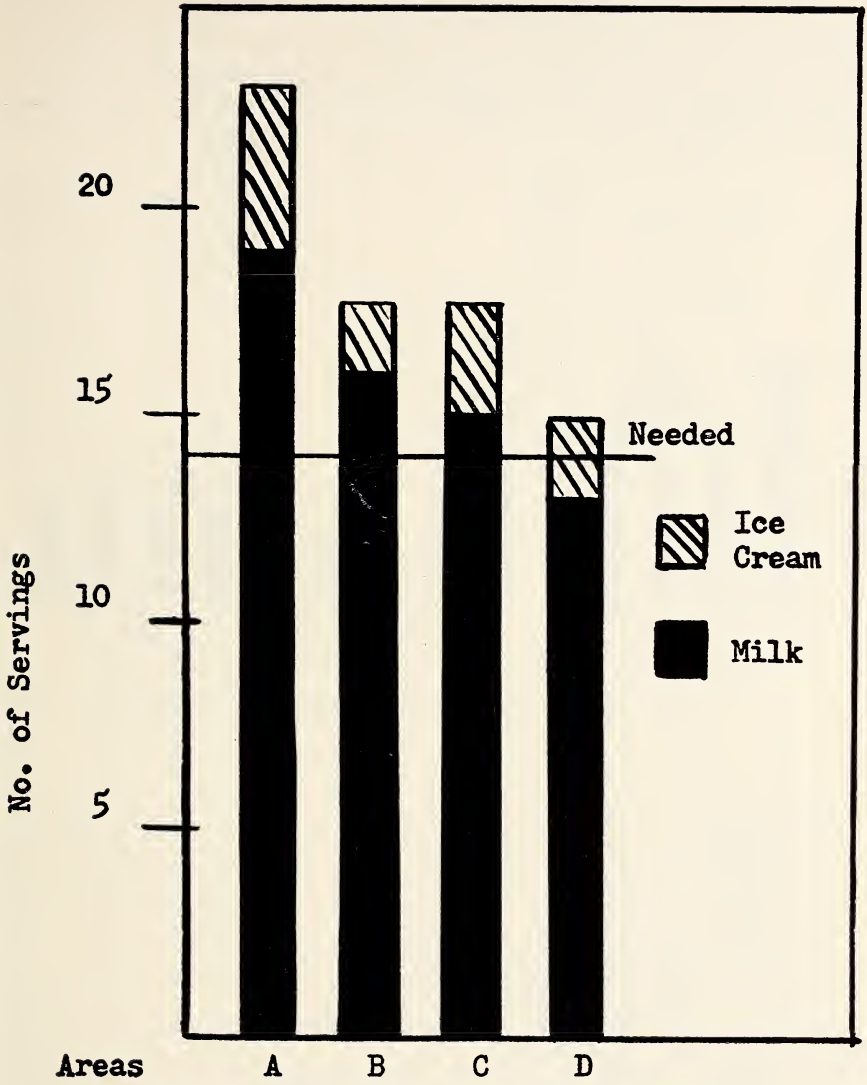


Figure 4. Plenty of Milk for Most of the Children.

the children failed to record the amount eaten is not known. Possibly the records were incorrect. The other fats eaten add to the number of calories for the day but do not furnish needed vitamin A.

It is interesting to note the differences in the amount of sweets and sweet desserts eaten in the four areas. The children in Area A, the sugar cane area, and in Area C, the delta area, ate more sweets than did those in Areas B or D (Figure 9).

On the whole the children of Louisiana appear to be well nourished. The deficiencies in the diet of the average child are few and the foods which do not meet the standards are eaten in nearly adequate amounts. However, how many children have diets which are dangerously low in some of the nutrients?

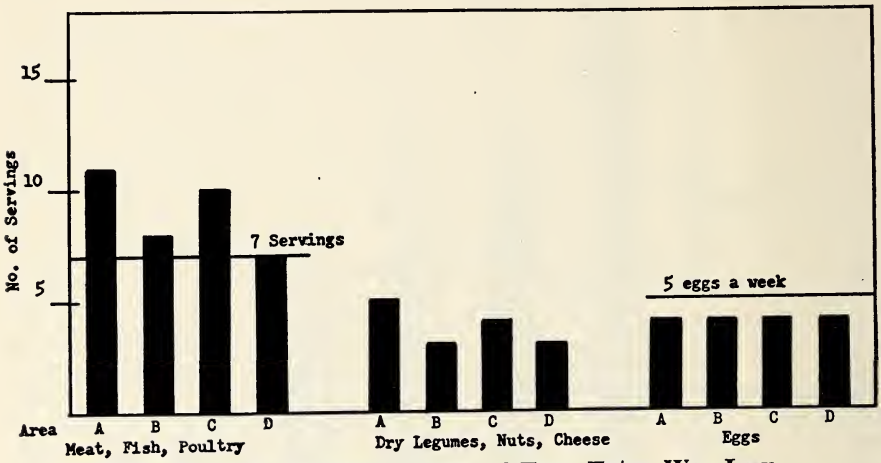


Figure 5. The Average Number of Eggs Eaten Was Low.

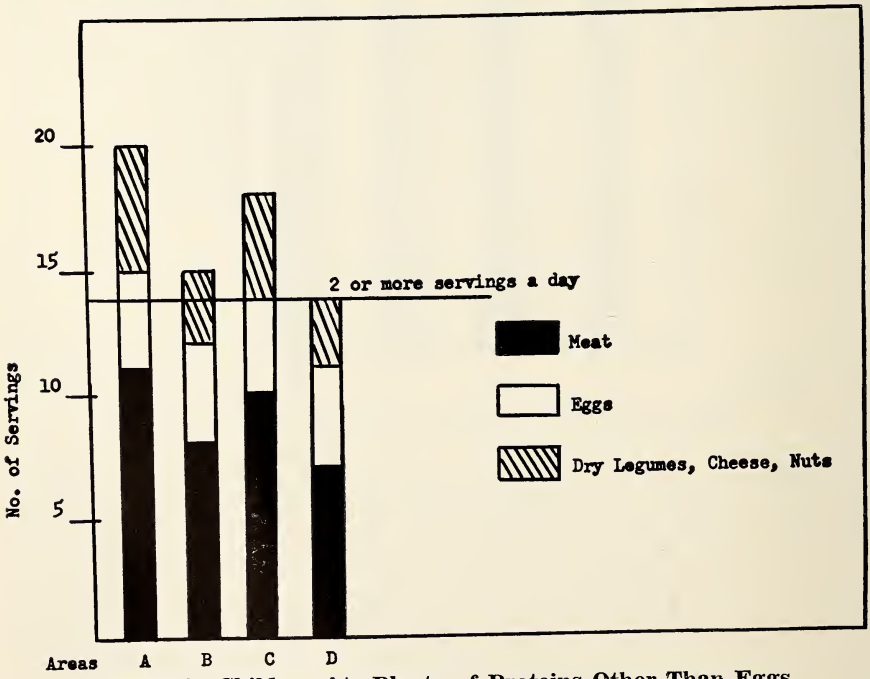


Figure 6. Children Ate Plenty of Proteins Other Than Eggs.

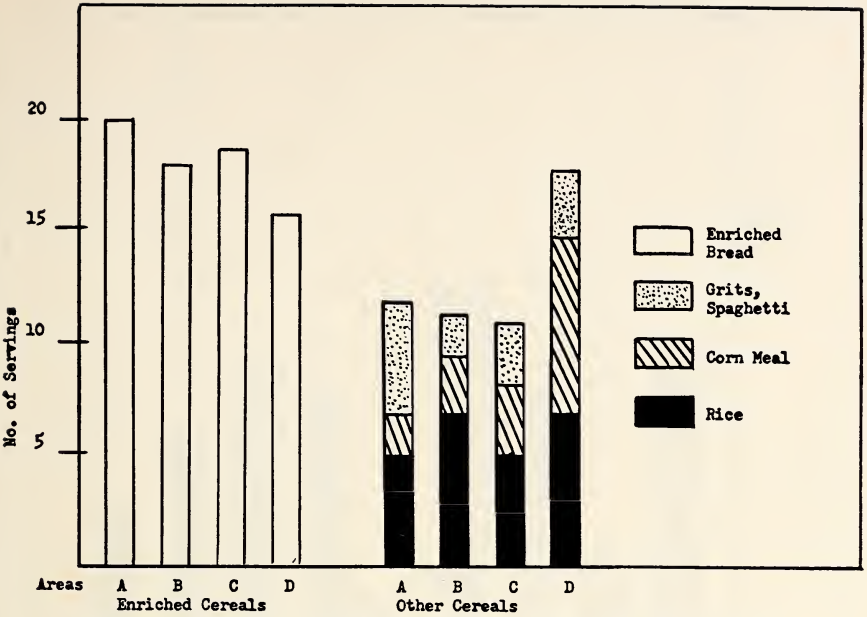


Figure 7. Cereals of All Kinds Were Abundant in the Diet.

THE DEFICIENCIES IN THE DIET

How Many Children Have An Inadequate Diet?

Table 4 and Figures 10 and 11 show that many of the children of the state do not have an adequate diet. Some eat ample amounts of the necessary foods. Others eat a fair amount of the essential food nutrients. Still other children have a diet totally lacking in one or more required foods. Count the number of children who have less than two-thirds the recommended amounts. Three food groups (leafy, green and yellow vegetables; citrus fruits; and eggs) should be given special consideration. In Area A, 248 children of the 752 ate less than two servings of leafy, green and yellow vegetables a week and 23 of these children had none. In Area B only 127 children were included in the study but 28 of these had too few of the leafy, green and yellow vegetables. In Area C, 60 children of the 231 studied failed to eat two-thirds of the required amount. In Area D only three children did not eat enough of these vegetables.

The lack of citrus fruits and tomatoes usually results in a diet deficient in vitamin C. In Area A, 45 children, or 6 per cent, had no foods from this group and 271 children (30 per cent) did not eat

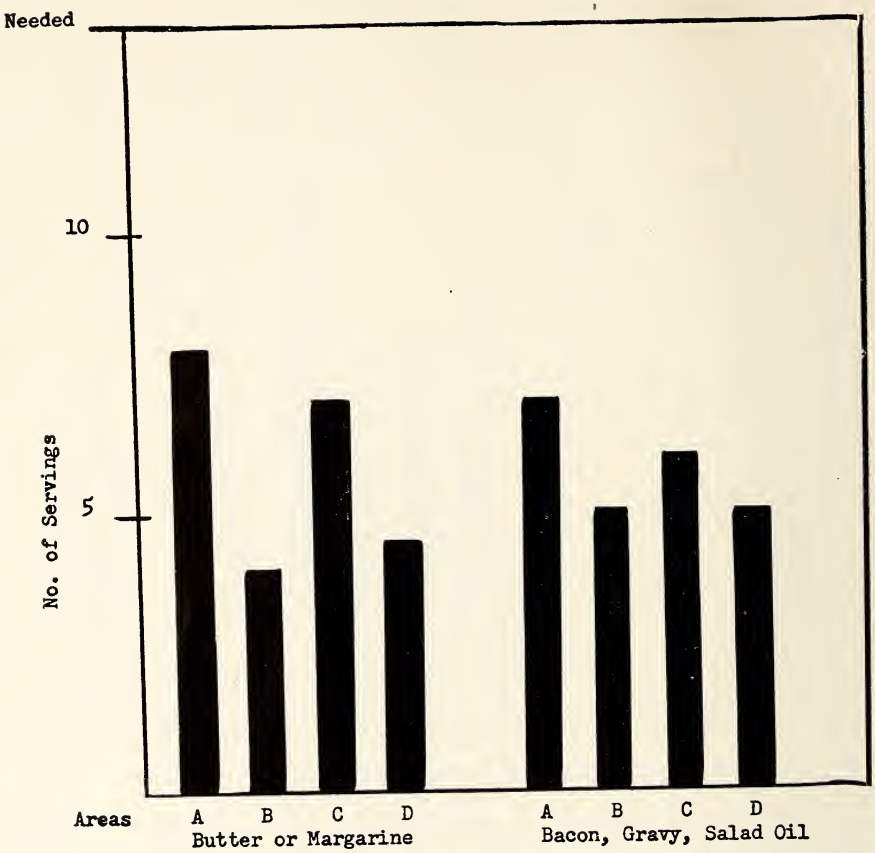


Figure 8. Vitamin A Is Found in Butter and Margarine, Not in Other Fats.

enough of this food. The percentages of children who had insufficient citrus fruit or tomatoes in the other three areas were 23 per cent in Area B, 45 per cent in Area C, and 17 per cent in Area D. It is well to note that this number in Area C represents nearly half of the children studied in that area. Some vitamin C may be obtained from other sources. The leafy, green vegetables (cabbage, broccoli) furnish appreciable amounts of this vitamin if they are eaten raw. However, many children in Areas A, B, and C ate insufficient amounts of these vegetables. When Irish potatoes are eaten daily, the vitamin C in the diet is increased. One serving of potatoes contains one-third as much vitamin C as a small orange. The amount of potatoes eaten by the children was low since rice was used often instead of potatoes. From the findings of this study one might expect to find some children who received insufficient amounts of vitamin C. This is one deficiency that should be

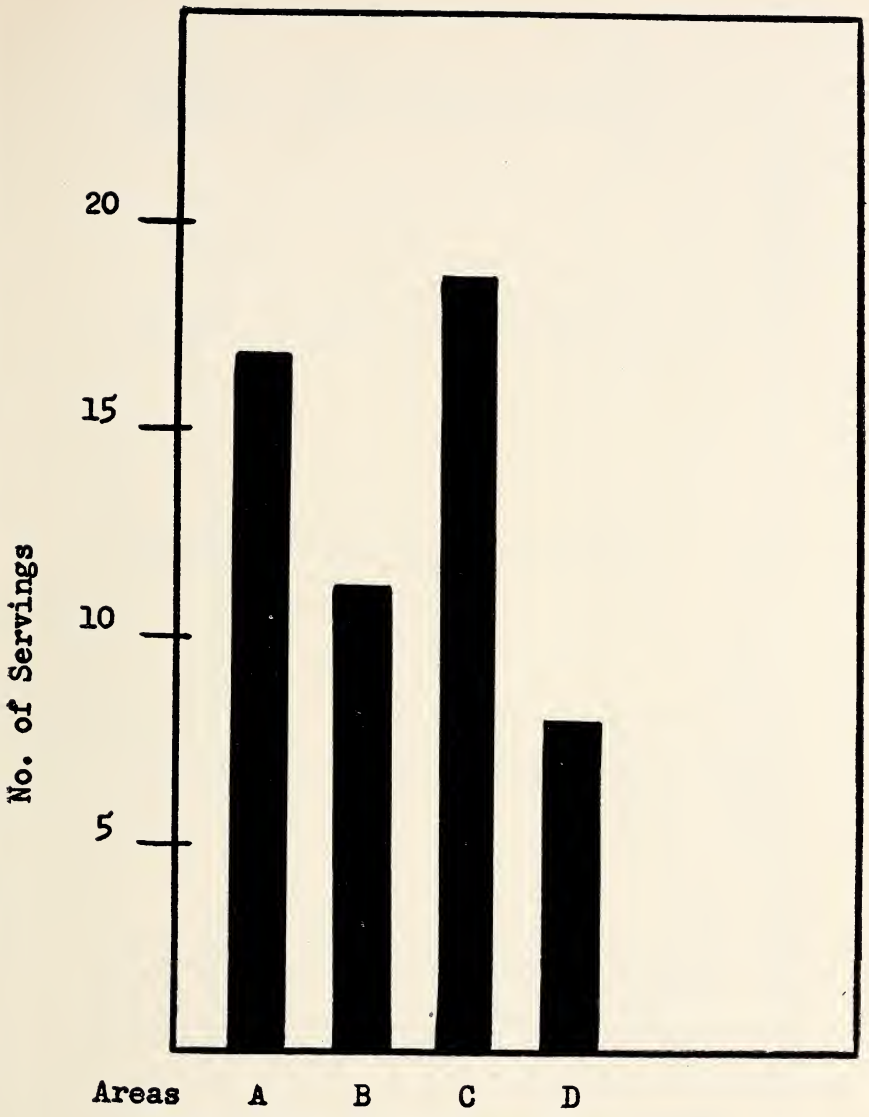


Figure 9. Cake, Pie, Cookies and Other Sweets.

guarded against in Louisiana. In the strawberry season or when oranges are plentiful the children undoubtedly eat more fruits high in vitamin C.

About a third of the children studied in all areas of the state ate too few eggs. In Area A, 271 children ate fewer than three eggs a week; 75 of these children ate none. In Area B, 44 children

TABLE 4. Percentage of 1,222 Children of the Four Agricultural Areas Whose Dietaries Contained 100, 99 to 57 Per Cent, 57 Per Cent to 1 Per Cent, or None of the Protective Food Groups as Recommended by National Research Council

Food Groups	Per Cent of N. R. C. Allowance	Agricultural Area			
		Area A 752 Subjects	Area B 127 Subjects	Area C 231 Subjects	Area D 112 Subjects
Green, leafy and yellow vegetables	100% & above	38	43	46	80
	99 - 57	29	35	29	18
	57 - 1	30	21	22	3
	0 Servings	3	1	4	0
Citrus fruit and tomatoes	100% & above	39	47	33	41
	99 - 57	25	31	23	41
	57 - 1	30	22	41	17
	0 Servings	6	1	4	0
Other vegetables and fruits	100% & above	67	59	78	80
	99 - 57	23	25	15	17
	57 - 1	10	15	7	4
	0 Servings	1	1	0	0
Potatoes	100% & above	17	19	20	23
	99 - 57	35	47	39	43
	57 - 1	45	34	37	30
	0 Servings	3	1	5	4

(Continued)

TABLE 4 (continued)

Food Groups	Per Cent of N. R. C. Allowance	Agricultural Area			
		Area A 752 Subjects	Area B 127 Subjects	Area C 231 Subjects	Area D 112 Subjects
Milk	100% & above	81	78	65	61
	99 - 57	15	16	22	23
	57 - 1	4	6	12	16
	0 Servings	0	1	1	0
Meat, fish and poultry	100% & above	82	74	87	65
	99 - 57	16	23	11	25
	57 - 1	2	3	2	10
	0 Servings	.1*	0	0	0
Eggs	100% & above	38	32	32	45
	99 - 57	26	33	30	31
	57 - 1	26	28	31	14
	0 Servings	10	7	7	10
Cereal grains and their products	100% & above	90	84	94	68
	99 - 57	7	13	5	28
	57 - 1	3	2	1	4
	0 Servings	.1*	0	0	0
Butter and margarine	100% & above	21	2	12	9
	99 - 57	28	13	34	25
	57 - 1	44	60	48	58
	0 Servings	8	25	7	8

*1 child.

TABLE 5. The Percentage of Children with Less than 57 Per Cent of Recommended Amounts

Food Groups	Area A	Area B	Area C	Area D	Average All Schools
Leafy, green, yellow vegetables	33	22	26	3	28
Citrus fruits, tomatoes	36	23	45	19	35
Other fruits and vegetables	11	16	7	4	11
Potatoes	48	35	42	34	44
Milk	4	7	13	16	7
Meat, fish, poultry	3	3	2	10	3
Eggs	36	35	38	24	35
Cereal	4	2	1	4	3
Butter - margarine	52	85	55	66	57

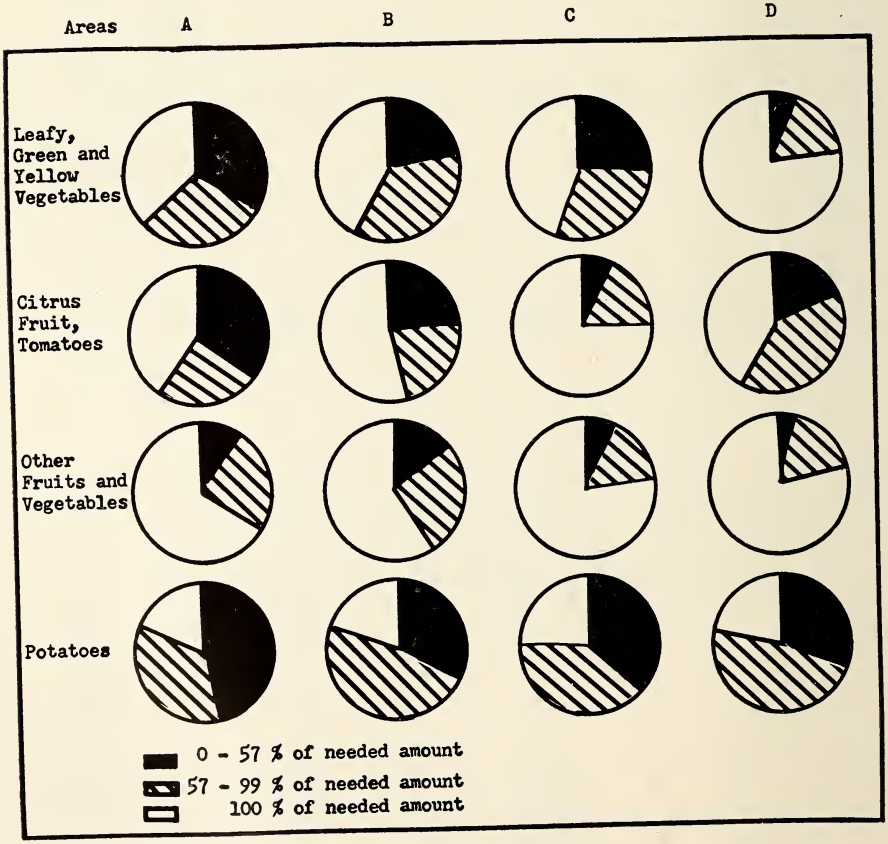


Figure 10. The Proportions of Children Who Had 0-57 Per Cent, 57-99 Per Cent, and 100 Per Cent of the Fruits and Vegetables Needed.

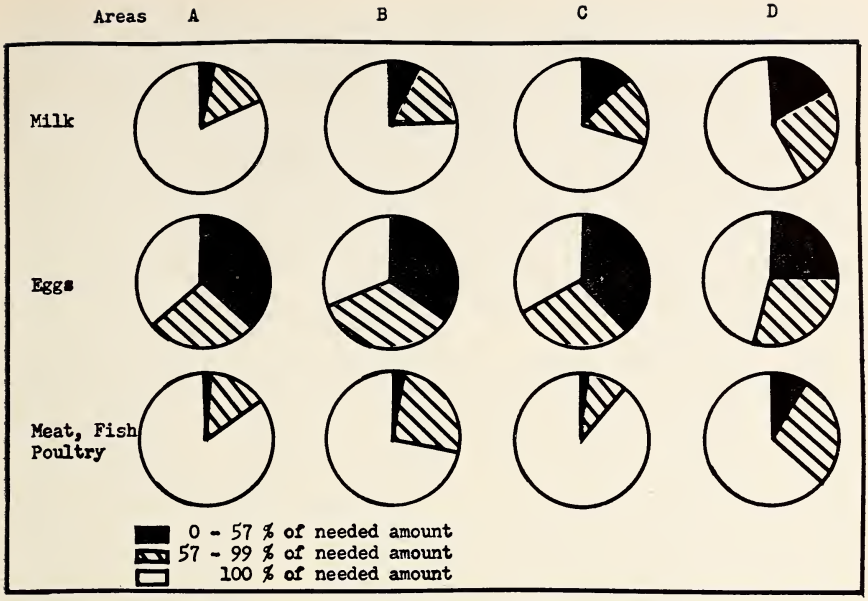


Figure 11. The Proportions of Children Who Had 0-57 Per Cent, 57-99 Per Cent, and 100 Per Cent of the Protein Foods Needed.

ate fewer than three eggs and 9 children ate no eggs during the week studied. Eighty-eight children in Area C ate fewer than the three eggs and 16 ate none. In Area D, 45 per cent of the children had five or more eggs a week but 11 children ate none and 30 children ate too few eggs.

The large amounts of meat eaten by the children and the more than adequate milk consumption partially compensate for the inadequacy in the number of eggs eaten. Meat, milk, and eggs are all good sources of protein. Milk contains many of the other nutrients found in eggs, with the exception of iron and vitamin A. Most varieties of meat are high in iron. The deficiency in eggs, therefore, is not as critical as it might seem at first.

Ninety-three per cent of all the children drank sufficient milk. This means that of the 1,222 children, 86 did not drink enough milk. In Area D the highest percentage had insufficient milk; 16 per cent, or 18 children, said that they drank less than two-thirds of the required amount of milk. While most of the children are getting the milk they need, the few who do not must be considered. The recent emphasis on the school lunch undoubtedly has corrected this deficiency in many cases (5).

Cereal products are well eaten by all children. In all areas ample amounts of enriched cereal in the form of white bread are

eaten. Very few children consumed less than two-thirds the requirement, though one child did not eat any enriched cereal.

A large percentage of children did not have sufficient butter or margarine. These children apparently eat less than the needed amounts of the three main food sources of vitamin A (leafy, green and yellow vegetables, eggs, butter or margarine). Certain fruits such as peaches and apricots contain appreciable amounts of this vitamin. Also, ice cream and cream add to the day's needs. Perhaps more margarine and butter were used than was reported. The lack of foods rich in vitamin A in the meals of Louisiana children should be remedied.

To sum up, the meals of many children (Table 5) in Louisiana are lacking in:

1. Foods that furnish vitamin A
   - Leafy, green and yellow vegetables
   - Butter and margarine
   - Eggs
2. Foods that are high in vitamin C
   - Citrus fruit and tomatoes
3. A food that is rich in iron, riboflavin, and vitamin A as well as in high quality protein.
   - Eggs

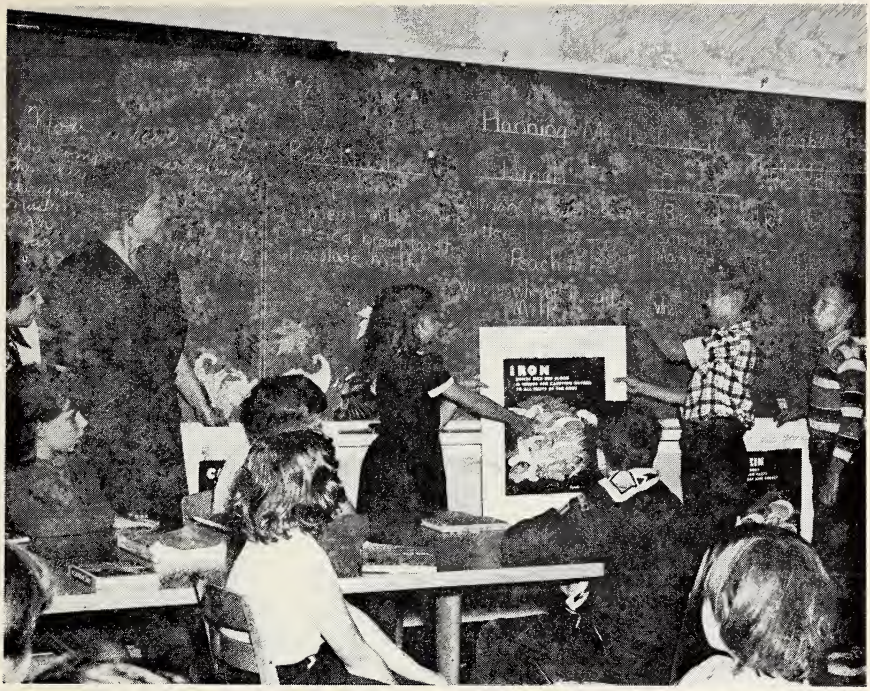
Generally the other foods were eaten in adequate amounts by most of the children.

SOME POOR FOOD HABITS

What Other Foods Do the Children Eat?

The children in Louisiana eat many desserts, candies, carbonated beverages, and other sweets. Such foods supply calories in the diet but very little of the other nutrients. Children need some high caloric foods, since an adequate intake of calories is essential to growth. When too many sweets are eaten, other foods usually are excluded from the diet.

The majority of children ate many of these sweet foods between meals. The amount and kind of food eaten depended on the individual child. Some ate only a little fruit, others ate nearly a full meal at irregular times of the day. The foods eaten between meals included the usual snack foods: ice cream, candy, soft drinks, fruit, sandwiches, cookies, cake, and pie. Hard candy and ice cream were eaten frequently. Soft drinks were not reported as often as might be expected. Milk was taken rarely between meals. Such foods as sausage, baked sweet potato, meat balls, and rice were re-



Learning the Value of Good Nutrition.

ported as "snacks" eaten between meals. Many children ate something between breakfast and lunch or after supper. The greatest number of snacks was eaten after school and before supper. Some children ate frequently during the day. Very few ate less than four times regularly every day.

Poor appetites at mealtime result from eating too much between meals. If the snack is a food which is low in nutrients (except calories) and if the child then fails to eat the needed food essentials, a poor diet results. If the snack supplements the diet by furnishing the required nutrients, the snack, itself, helps to improve the child's diet. Snacks, consisting of fruit, milk, ice cream, or highly nutritive cookies (such as molasses cookies) are much preferable to the consumption of candy, carbonated beverages, or rich pastry. Ice cream furnishes many essential nutrients and is widely eaten between meals. It should not be eaten in place of fruit, vegetables, and other necessary food, however.

The children in the four areas all ate between meals to some extent. In Areas A and C more cakes, pies, cookies, and concentrated sweets were eaten (Figure 9) than in the other two areas.

The large amounts of concentrated sweets eaten by the children in these two areas is especially interesting. Much of this "concentrated sweet" was candy. It should be noted that in these two areas fewer children had enough citrus fruit than in Areas B and D. Perhaps these children might be taught to eat fruit instead of candy between meals.

Another poor food habit noted among many Louisiana children was the missing of regular meals. Sometimes a snack (usually pop corn or candy) replaced the regular meal. The meal most often missed was supper, though some children missed breakfast or, occasionally, lunch. Many times a child missed a meal on Saturday or Sunday. The reason given was that the child had gone to the movies, eaten popcorn and so was not hungry for supper. The missing of meals was not habitual with certain children, apparently, but was not unusual for a number of them. This habit again leads to a poor diet.

Children will always, at times, eat snacks. What children eat is more important than when they eat it. Children can be given the more nourishing foods between meals, can be taught to eat more regularly, and can learn the importance of eating nutritious food. Parents must be taught also the need for furnishing their children with the essential foods for growth and development.

SOME EFFECTS OF DEFICIENT DIETS

Can the Results of An Inadequate Diet Be Seen?

Are there ways of knowing how a poor diet affects a child? It is very difficult to find any direct relationship. The effects of a sub-optimal diet appear slowly. Many of the necessary food elements are vitally needed for the growth of bone, muscle, and tissue. Other nutrients function to preserve the health and maintenance of body tissue. Still others aid the work performed by the body such as digestion, the transformation of food into energy, the building of blood, or the activity of the organs of the body. Since the uses of the food eaten are so varied and since most functions of the body partially depend upon the food a person eats, it is nearly impossible to point to the direct result of poor eating habits. The results of a poor diet may not be seen in the child but the habitually poor diet eaten over the years of growth may develop into serious complications in the health of the older individual.

Various measurements have been used in the attempt to judge the nutritional well-being of children. A few of the children

Good Lunches Mean Better Health.

who took part in the dietary survey were studied more closely to try to determine the effect of either a good or a poor diet on the children (6). Most of these children were from schools in Area A. Sixty-two children in Bossier elementary school in Area C were used also.

One way nutritionists measure whether a person has enough of a certain nutrient (usually a vitamin) is to find out how much of that nutrient is in the blood. The amount of vitamin A and vitamin C in the blood of 425 children from Area D and 62 children from Area C was studied (6). The hemoglobin of the blood also was measured. A doctor examined the children, looking for visible physical signs of poor nutrition, such as, changes in the skin; redness on the edges of the tongue; red, sore gums; and even poor posture. All this information was combined with the findings in the dietary survey of the same children. The investigators then tried to see if there was a connection between the diets and the physical or chemical measurements.

It was found that the effects of vitamin A deficiency in the diet are not easy to see immediately. Five per cent of the children

had an amount of vitamin A in their blood which was considered too low for good health. Although some of the clinical symptoms of vitamin A deficiency were found in a few children, it was impossible to relate them directly to a diet low in this vitamin.

Thirty per cent of the children had a low amount of vitamin C in their blood serum (6). There was some evidence that a bleeding or a redness of the child's gums might be connected to a low amount of vitamin C (ascorbic acid) in the blood serum. Also, there was some indication that the amounts of this vitamin in the blood serum may depend upon vitamin C content of the diet.

The amount of hemoglobin in the blood is indicative of a good supply of iron in the diet. In the condition known as "nutritional" anemia the amount of hemoglobin in the blood becomes lowered. Ninety-five per cent of the children studied had a normal amount of hemoglobin. Since most of the children ate an adequate amount of meat, their supply of blood building material was ample.

As the result of these tests it was seen that it is difficult to measure the effects of a sub-optimal diet unless some extreme deficiency is present. The diets of most of the children were good. Some children did not receive an optimal diet, and a few diets might be classed as poor. Extreme deficiency symptoms do not appear until the nutrient has been very low or lacking from the diet for a long period. However, slight deficiencies do appear. For example, there appeared to be a connection between sore, bleeding gums and vitamin C deficiency. The results of all these studies are reported in detail by Moschette and others (6). The long-time effects of slight deficiencies are unknown. It is certain, however, that for maximum growth and for the best of health, an adequate diet is essential.

SUMMARY

The Questions Answered

How Were the Needs of the Children Measured?

The foods eaten daily by each child were divided into ten classes. Foods from each of these groups must be eaten daily to assure a diet adequate in every respect. The ten food groups were:

Leafy, green and yellow vegetables
Citrus fruit and tomatoes
Other fruits and vegetables
Potatoes
Milk
Eggs

Meat, fish, and poultry
Legumes, cheese, and nuts
Enriched or whole grain cereals
Butter or margarine

The number of servings each child ate from each of these groups was counted and compared to the amounts recommended by the National Research Council.

What Do the Children of Louisiana Eat?

The children in the schools studied ate some food of each type. They ate a variety of leafy, green and yellow vegetables. Some had plenty of citrus fruit. Many ate more of the other kinds of fruit and vegetables. Rice was eaten frequently in place of Irish potatoes. The protein foods (milk, meat, eggs) were eaten by all children in all areas. Cereals of all kinds were well liked. In addition to white bread, the other cereals which were popular in various areas were rice, spaghetti, hominy grits, and corn meal.

How Well Do Louisiana Children Meet Requirements?

The children failed to eat enough of four types of food: leafy, green and yellow vegetables; citrus fruit and tomatoes; eggs; and butter or margarine. In Areas A, B, and C there were many children who did not have enough leafy, green or yellow vegetables and who ate inadequate amounts of citrus fruit or tomatoes. Too few eggs were eaten by the majority of children and many children did not eat any. Butter and margarine were eaten in small quantities. On the whole it appeared that the children ate insufficient amounts of the foods containing vitamins A and C.

How Many Have Inadequate Diets?

About 30 per cent of the children in the schools studied have diets that are inadequate in some respect. This means that of the 1,222 studied, 367 children did not have the optimum diet for growth and health.

What Are the Results of an Inadequate Diet?

The results of an inadequate diet are difficult to measure. There are certain physical and chemical tests which are used as indicators of dietary deficiency but these tests do not reflect directly the dietary intake. Slight symptoms of deficiency are not recognized easily. Good health can result only if the diet has been completely adequate.

What Can Be Done in Louisiana to Improve the Diets?

Emphasis should be placed on the importance of vitamin rich food in the diet. Children, their parents, and their teachers should be given instruction in food needs. The school lunch has aided materially in increasing the protective foods in the diets of many children. Also, the school lunch can be used as a teaching medium to show children how to select nutritious foods. The selection and preparation of food so as to preserve vitamin content must receive added emphasis.

Several ways to improve the eating habits of children are:

1. Training the children to like and to select the foods that are good for them.

2. Showing the parents how to select the variety of foods needed for an adequate diet.

3. Teaching the importance of the preservation of vitamin quality in foods by good marketing practices and proper preparation procedures.

4. Showing parents their responsibility in providing adequate daily needs regularly in the home.

5. Obtaining the cooperation of teachers in helping the children to learn the value of good nutrition.

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